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Implications of Chemical Weapons Proliferation

National Intelligence Estimate

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August 1985

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IMPLICATIONS OF CHEMICAL WEAPONS PROLIFERATION

Information available as of 15 July 1985 was
used in the preparation of this Estimate.

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THIS ESTIMATE IS ISSUED BY THE DIRECTOR OF CENTRAL
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The Central Intelligence Agency, the Defense Intelligence Agency, the Assistant Chief of Staff for Intelligence, Department of the Army, and the intelligence organization of the Department of State.

Also Participating:

The Director of Naval Intelligence, Department of the Navy

The Assistant Chief of Staff, Intelligence, Department of the Air Force

The Director of Intelligence, Headquarters, Marine Corps

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SCOPE NOTE

This Estimate addresses the spread of offensive chemical warfare (CW) capabilities outside the NATO/Warsaw Pact arena. It is concerned mainly with those agents developed during and since World War I and commonly considered "traditional chemical agents." Although the importance of biological weapons and the potential for development of new agents by application of advances in biotechnology are recognized, our data base is less cohesive and the issues are sufficiently different from chemical weapons proliferation to warrant separate treatment in a future paper.



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This Estimate examines the implications of CW proliferation for the following areas:

- National security.
 - Arms control.
 - Potential for terrorist use.
 - Economic and political spheres.
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KEY JUDGMENTS

Proliferation of chemical warfare (CW) capabilities imperils the prospects for consummation of an effective global ban on chemical weapons. States with recently acquired CW capabilities may be unwilling to ratify or accede to a treaty banning chemical weapons if they doubt accession or compliance by hostile neighbors. Further, the growing availability of chemical weapons increases the likelihood of their use.

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Since the early 1960s, chemical weapons capabilities have been acquired by 10—and possibly 12—nations, primarily in the Middle East and Asia. At least a dozen additional nations are now in the nascent stages of CW program development. This trend will continue because:

- The technology is readily available.
- Chemical weapons are relatively inexpensive.
- There is a perception of increasing CW threat from adversaries.
- Chemical weapons increasingly are seen as a militarily useful adjunct to conventional weaponry.
- The political costs of chemical weapons possession or use are judged to be acceptable.
- There are no international constraints on possession of chemical weapons.

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The success and publicity of the Iraqi CW program and minimal international sanctions in response to CW use may have been strong motivators to a number of the Middle Eastern states. Thus far, Iraq's use of CW has helped—but has not been essential to—Iraqi success on the battlefield. We judge that Iran now possesses a limited supply of chemical weapons and is likely to use them in retaliation to Iraqi use.

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The ready availability of chemical weapons in the Middle East and their growing presence in Asia significantly increase the potential that US or Allied forces deployed to these regions, in either military actions or peacekeeping roles, will be direct or inadvertent victims of chemical attack.

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Likewise, the spread of CW capabilities into Third World states increases the likelihood that terrorists will acquire these weapons and/or

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the capability to produce and deliver them. We cannot discount the possibility that states such as Libya or Iran would sponsor or assist terrorists in acquiring chemical weapons.

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Proliferation of CW programs has created a growing international market in sales of CW-related materiel and technological expertise. The expanding Third World petrochemical, pesticide, fertilizer, and pharmaceutical industrial base has created an essential precondition for further growth. International controls placed on CW precursor chemicals and processing equipment have been largely ineffective at slowing the rate of proliferation. The profits to be made through sales and the dual-use nature of relevant materials and technologies make effective control over them extremely difficult

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As Third World chemical warfare programs and CW-materiel industries mature, CW training and logistic and production assistance increasingly will be sought from countries that have recently developed strong domestic programs. Concurrently, the ability of the industrialized CW-capable states to slow CW proliferation will further be diminished. Western interference with CW acquisition by developing nations is likely to be viewed by those countries as an effort to restrict their increasing military prowess.

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Although we have sufficient information to assess the state of CW program development in a number of nations, we lack confidence that we know the full extent of the CW threat worldwide. Often there are few indicators that signal chemical weapons production or possession before their actual use. Latent capabilities may yet exist in some areas of the world.

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DISCUSSION

Trends in Proliferation

Expansion of Capabilities

1. Never before have so many nations possessed offensive chemical weapons capabilities.

Burma, Egypt, Iran, Iraq, Israel, North Korea, China, Syria, Taiwan, Vietnam, and possibly Libya

have acquired chemical weapons stockpiles and thus are capable of conducting chemical warfare (CW). In the absence of international constraints on possession of chemical weapons, these countries have all either recently acquired CW capabilities or demonstrated an active interest in maintaining their capabilities.

The turbulent Middle East and East Asia have become the focuses of chemical weapons proliferation activity as is displayed on the map. In addition, a number of countries including Nicaragua, Indonesia, Jordan, and others are taking steps to increase their CW protective posture and may seek in the future to acquire chemical weapons.

We cannot be certain that there are not other countries with CW capabilities, because any nation with a developed industrial base and mature defense industry could establish the capability to field chemical weapons if it so chooses.

2. The scale and maturity of the Iraqi program have brought chemical weapons into the Middle Eastern political-military equation to stay. Through sustained and systematic effort, Iraq has developed a state-of-the-art capability to manufacture chemical weapons with foreign, particularly West European, assistance. Predictably, Iran and Syria are making major efforts to develop chemical weapons in response. Other nations will be influenced by the extent to which Iraq's security is perceived to have been enhanced by its chemical weapons acquisition.

3. There are several explanations for the rapid increase in the number of developing nations that have acquired chemical weapons capabilities:

- The technology is readily available.
- Chemical weapons are relatively inexpensive.
- There is a perception of increasing CW threat from adversaries.

— Chemical weapons increasingly are seen as a militarily useful adjunct to conventional weaponry.

— The political costs of chemical weapons possession or use are judged to be acceptable.

4. The accelerating growth in the Third World of petrochemical, fertilizer, pesticide, and pharmaceutical industries has created an essential precondition for spread of CW capabilities, that is, the knowledge and technical expertise to produce chemical agents. Because the high cost of modern conventional or nuclear weapons places a significant burden on their economies, low-cost, low-technology chemical weapons may prove to be an attractive, viable alternative. The growing, but largely unregulated, international market in CW materiel places the requisite items within both the reach and the financial means of the military forces of developing nations.

5. Proliferation begets proliferation. Acquisition of chemical weapons by a nation causes its neighbors to reassess their military requirements. In regions of imbalance of strategic forces, possession of a CW capability may enhance a nation's force posture and offer a degree of national self-sufficiency and self-assurance not otherwise available. Compared to development of nuclear weapons, whose production requires development of a highly specialized technical base and acquisition of unique materials, chemical weapons can be produced from readily accessible materials using less sophisticated technology. Therefore, proliferation is more likely to occur in response to recognition of a new regional CW threat than is the case with nuclear weapons. The subdued international response to the use of CW in Southeast Asia, Afghanistan, and the Iran/Iraq war is likely to cause other nations to judge that use of CW will not incur unacceptable international censure or sanctions.

Role of External Support

6. Technology transfer has played an important role in the spread of chemical weapons capabilities. Most frequently, technology is transferred through direct sales of precursor chemicals, processing equipment, and shell casings and through contractual agree-

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ments for technical expertise. In some cases the supplying firm is witting of the end use of its material or assistance.

In other cases, effective use of intermediaries hides the ultimate purpose or user.

7. An example of state-provided assistance in acquisition of CW capabilities is provision of CW training and protective and decontamination material. Such assistance is regularly provided by the armed forces of the United States, Soviet Union, and others to their allies. More insidious, however, is direct military assistance in chemical weapons production.

8. The full spectrum of technology transfer mechanisms has abetted CW proliferation. In past years, the Soviets directly transferred chemical weapons to Egypt, Vietnam, and Laos but maintained varying degrees of control.

Today, however, most nations are seeking to acquire indigenous production capabilities with the result of diminished foreign control. Not only are chemical weapons and the raw materials transferred, but also the essential technologies through sales of turnkey factories, manufacturing and processing technology and equipment, material development and technical assistance, and training.

Political and Economic Impact: Problems and Prospects

9. Proliferation of CW programs has created a growing international market in sales of CW-related equipment as well as technical expertise. We estimate, for example, that Iraq has spent about \$200 million on its CW program over the past decade and makes use of numerous suppliers, both to avoid dependence on a single supplier and to circumvent controls on particular items of equipment and materials. Although a number of West European firms

have been major suppliers are also becoming competitive in the marketplace. Should access to these suppliers be restricted, we anticipate that other rapidly industrializing and East European nations will eagerly fill the void.

10. We expect that sales of protective masks and garments, detection and decontamination equipment, antidotes, and other CW-related materiel will increase

significantly. Most nations, especially the developing countries, will be reluctant to prohibit their industries from competing in this lucrative market. Furthermore, most nations have legal strictures against impeding fair trade. The momentum for foreign sales is caused by the pressure to exploit export markets brought about by limited domestic economic growth in Europe. In many cases, but certainly not all, the acquiring military organization deals directly with private industry without the knowledge of the supplier's government.

11. Because many of the precursor chemicals and most of the processing equipment required for chemical agent production have numerous legitimate industrial applications, it is difficult, if not impossible, to implement blanket export constraints on them. To the extent that they do exist, trade controls on CW-related chemicals have not been effective in preventing Third World nations from developing CW capabilities. A nation can circumvent efforts to constrain its CW program development through a number of mechanisms:

- Disguising the end user in material acquisitions.
- Using different chemical agent production methodologies.
- Developing indigenous production capabilities for precursor chemicals and equipment.
- Seeking alternative suppliers.

12. Thus far, the prospects for sufficient international cooperation to develop and enforce more effective controls seem poor. Once chemical agent production has begun, the international ability to cause a slowing or cessation of a burgeoning CW program through imposition of restrictions on trade may exist for only a short period of time. For example, embargoes on chemical exports have made it more difficult for Iran and Iraq to obtain the chemicals needed to synthesize warfare agents but have not completely cut off supplies.

13. Iraq provides an excellent example of the difficulties of attempting to halt a CW program. Initially, we had limited information on the Iraqi sources of precursor chemicals. Following Iraq's use of nerve agent and mustard in the spring of 1984, the United States and a number of European countries placed embargoes on sales of specific chemicals. However, Iraq was able to find other sources of supply and began to disguise the end user in its purchase orders. When the embargo began to affect its chemical agent

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**Problems for Export Control:
Chemical Precursors Often Dual Use**

There are very few CW agent precursor chemicals that have no legitimate industrial use. One such chemical is methylphosphonyl difluoride (referred to as di-fluor or DF), which produces the G-type nerve agents, such as sarin, when mixed with an alcohol. This chemical is under foreign policy export control by the United States, United Kingdom, West Germany, and the European Economic Community. However, there are no known producers of this chemical in the United States or Western Europe.

The majority of CW agent precursor chemicals also have important industrial applications. An example of such a dual-use chemical is phosphorus oxychloride, which can be used to produce the nerve agent tabun. Legitimately, phosphorus oxychloride is used in the manufacture of pesticides, plastic and elastomer additives, hydraulic fluids, and surfactants.

Currently, there are five known plants in the United States and six known plants in Western Europe that produce phosphorus oxychloride. They export thousands of tons of this chemical each year. This chemical also is under foreign policy export control by the United States, United Kingdom, West Germany, and the European Economic Community.

But phosphorus oxychloride is easily manufactured by oxidizing phosphorus trichloride. Therefore, the export controls on phosphorus oxychloride can be circumvented by purchasing phosphorus trichloride, which is not under any export controls. Phosphorus trichloride is produced in much larger quantities than phosphorus oxychloride and is used for commercially important products such as pesticides, flame retardants, and solvents, as well as phosphorus oxychloride. There are at least five known US plants and seven known West European firms that produce phosphorus trichloride.

In addition to chemical agent precursors, there are some ubiquitous chemicals that can be used as CW agents directly but which also have legitimate industrial uses. One such chemical is phosgene, a choking agent first used in World War I. Commercially, phosgene is used in the production of polyurethanes, polycarbonates, and in the synthesis of chloroformates and carbonates, which are used as intermediates in the synthesis of pharmaceuticals and pesticides. The majority of phosgene produced is used to manufacture plastics, an important global industry. Phosgene is under no foreign policy export controls because it has so many important industrial uses. Other such chemicals include hydrogen cyanide, cyanogen chloride, diphosgene, arsine, and adamsite. Even sulfur mustard has some legitimate industrial uses.

production capability, Iraq turned to different manufacturing processes and began to seek the capability to produce domestically all the necessary production equipment and chemicals.

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15. The United States is the only nation that publicly discusses its CW program. Most other nations consider CW issues to be such sensitive subjects that they refuse to engage in open discussion concerning them. Many friendly European and Third World nations resist publicly accusing others of using CW, particularly the Soviet Union and its allies, because they both fear reprisals and question the efficacy of such accusations. Most US allies would rather maintain silence or work quietly through diplomatic channels.

16. West European governments, which would seem to be natural allies on efforts to stop CW use and proliferation, have their own reasons for preferring to keep CW out of the public spotlight:

17. Other friendly nations deny possessing a CW program. For example, when the United States appealed to a Middle Eastern government to stop supplying CW materiel and expertise to Iraq, implying the possibility of Congressional delay or disapproval of US foreign aid, the Defense Minister flatly denied that his government had a CW program, and the subject was closed to further discussion.

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18. We expect to see a *decline* in the ability of industrial states to use their political and economic influence to halt chemical weapons proliferation. As Third World chemical weapons programs and CW-materiel industries mature, CW training, logistic, and production assistance increasingly will be sought from countries such as Iraq, Egypt, and Israel, which have developed strong domestic programs.

Furthermore, because chemical weapons are but one part of defense modernization packages, Western interference with acquisition of CW capabilities is likely to be viewed by developing countries as an effort to restrict their increasing military prowess. Nations seeking to become CW capable are likely to charge discrimination, as they do regarding the Nuclear Non-Proliferation Act.

19. Although not directly aiding chemical weapons proliferation, acquisition of a protective capability is an essential element of CW program development. Therefore, we believe that nations seeking to halt chemical weapons proliferation may be forced to reevaluate their policies regarding sales to developing nations of CW protective, detection, and decontamination equipment. Efforts to stem proliferation of CW capabilities and yet meet the legitimate defense needs of one's allies will pose a wrenching conflict for governments.

Security Aspects of Proliferation

Role of CW in Recent Conflicts

20. *Southeast Asia and Afghanistan.* Chemical and toxin warfare agents have been used in the late 1970s and early 1980s by Soviet forces in Afghanistan and Soviet-supported regimes in Laos and Cambodia.² We believe that the factors precipitating use of these weapons include a lack of a protective or retaliatory capability by the resistance, tactical utility for guerrilla warfare, a low risk of exposure, and opportunity for plausible denial. We do not know what utility the Soviets and their surrogates may have ascribed to chemical warfare as used in these regions.

21. In Southeast Asia, Vietnam, with Soviet assistance, has used CW against unprotected Lao and

Cambodian populations as a terror and area denial weapon, with the objective of driving resistance forces from their homelands. There also has been an opportunity to field test agents and delivery systems, and possibly to perform some medical assessments of the effects of chemical agents. Vietnam is also reported to have used CW in border conflicts with the People's Republic of China.

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22. In Afghanistan, the Soviets have used CW against mujahedin resistance forces. The use of chemical weapons has contributed to depopulation of some contested areas, thereby reducing the bases of support for resistance forces. We judge that the Soviets have also taken advantage of the war in Afghanistan to test both chemical agents and delivery systems. Unlike the situation in Southeast Asia, we believe that the Soviets maintain control over the movement, storage, and use of chemical weapons in Afghanistan.

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23. To date, the Soviets have been moderately successful at orchestrating a propaganda campaign that discounts their use of CW. This, combined with the difficulty of obtaining persuasive evidence from remote and denied areas, has led many to doubt whether any chemical agents have been used, and, if so, whether the agents were lethal.

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There is no evidence since early 1983 of use of CW in Afghanistan.

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24. Reasons postulated for the decline in reports of CW use in these regions include:

- Objectives were achieved.
- Sufficient success with conventional weapons obviated need for further CW use.
- Operational difficulties were encountered.
- Completion of a testing program.

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- Public pressure.
- Inadequate intelligence collection or lack of confirming evidence.

Although we cannot judge which of these reasons most accurately reflects reality, we believe a combination of the first five factors has led to a real decline in CW use in Southeast Asia and Afghanistan.

25. *Iran-Iraq.* The combat use of mustard and tabun has enabled Iraqi troops to drive back the Iranians more rapidly and with fewer Iraqi casualties than might otherwise have been the case. Despite Iranian charges that Iraq has been using chemical weapons throughout the war, we assess that Iraq has used lethal chemical weapons in only four battles since August 1983. Earlier press reports that Iraq was using lethal chemical weapons appear to have been based on sporadic use of the riot-control agent CS (tear gas), white phosphorus artillery rounds, and smoke rounds. Iran has not yet used lethal chemical weapons during the war, but has used CS in isolated instances.

26. We assess that the Iraqis are not insensitive to the adverse publicity to their use of CW.

the Iraqis feel that it is only part of a larger propaganda effort against Iraq, and therefore they have decided to deny the use of chemical agents. If in the future they are forced to acknowledge the use of CW, they will most likely claim it was only used in self defense and only against enemy forces on Iraqi territory. The decision to use CW was made recognizing and in spite of possible repercussions.

27. the Iraqis believe their use of CW against the Iranians has been successful. They believe that, while the tactical benefits have been good, there is room for improvement that could be obtained by use of larger quantities of agent and use of other (more toxic) agents. They also believe CW has had a negative impact on Iranian morale. On the other hand, two side effects were noted among Iraqi soldiers: chemical weapons use gave some soldiers increased confidence, while in others it created a fear of retaliation-in-kind by Iran.

28. We judge that Iran has a limited supply of chemical weapons and is likely to use them in retaliation to Iraqi use. Iranian spokesmen have repeatedly threatened in public forums to retaliate in kind for Iraqi use of chemical weapons.

Iran planned to initiate a new offensive early in 1985 with a chemical airstrike against Iraqi troops near areas north of Al Basrah; however, the offensive

Chronology of Iraqi CW Use

We assess that Iraq had only small quantities of mustard and nerve agents available for research and testing when the war with Iran began. The fighting, however, spurred Iraq to speed up production, and by 1982 Iraq began producing significant quantities of mustard agent. Approximately 1,000 artillery shells filled with mustard agent had been accumulated when the Iranians mounted their first invasion of Iraq in July 1982. at least some of these shells were moved to a depot near the fighting, but they were not needed. Instead, mortar shells filled with nonlethal CS gas were used successfully to break up Iranian infantry assaults. This was the first large-scale use by Iraq of riot-control agents in the war.

In August 1983, Iraq used a limited quantity of mustard agent against Iranian troops near Haj Umran in northern Iraq. The Iraqi attacks were very limited, however, and only a few Iranians were seriously injured.

November 1983, Iraq used mustard agent for a second time during a major battle near Panjwin in northern Iraq. This time the Iraqis conducted a much larger attack with chemical weapons, firing several hundred shells filled with mustard agent at Iranian forces threatening to overrun Iraqi frontline positions. Several hundred Iranian troops reportedly were killed or severely wounded by the mustard agent.

In early 1985, during a second major battle in the marshes north of Al Basrah, Iraq again used mustard and nerve agents against attacking frontline Iranian forces and rear area troop concentrations. Press reports indicate that at least several hundred Iranian soldiers were killed or wounded by chemical agents.

was never launched, and chemicals were thus not used. Moreover, the Iraqis have not used chemical weapons on a large scale since early 1985, depriving

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the Iranians of an opportunity to retaliate in kind. Reported dissension between the Iranian military and religious leaders over CW employment may also explain the decision to abstain.

29. Iran's mounting frustration with the muted international response to Iraq's use of CW may prove sufficient for a decision to retaliate in kind. Because of the political costs, such a decision would not be made lightly, and CW would most likely be employed against limited selective targets. However, the recent use of conventional missiles against major population centers by both Iran and Iraq raises the concern of CW against civilian targets. Although we judge such use unlikely, the barriers of restraint are eroding. The Iranian stockpile and delivery capabilities are not believed to be sufficient for extensive tactical use

Impact on Balance of Power

30. **Middle East.** Shifting political alliances in the Middle East and the attendant changes in perception of external threats have stimulated nations to undertake major defense modernization programs. Their military forces have acquired some of the most modern conventional weapons available. We have seen development of chemical weapons programs as a small part of the weapons acquisition programs in Israel, Iran, Iraq, Syria, Egypt, and possibly Libya.

32. The Iran-Iraq war has seen new tactics in Middle Eastern warfare with the use of chemical weapons and human wave assaults. However, even given the possession of CW capabilities by most of the Middle Eastern major powers

[redacted] we do not expect that chemical weapons will be used *indiscriminately* because of expectations of retaliation-in-kind. However, recent experience indicates that, when faced with situations of overwhelming manpower superiority, or a threat of major invasion, chemical weapons may be used to turn the tide of the battle.

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34. We cannot discount the possibility that countries such as Iran and Libya, whose current leaders have shown little inhibition in defying international norms to achieve political objectives, would use CW in a surprise attack on foreign forces or, more likely, against US interests.

35. **Asia.** For the most part, the military forces in Asia possess technologically less advanced weapons, and the imbalance of both conventional and chemical force postures is greater than in the Middle East. Sporadic guerrilla actions prevail, rather than the opposed forces warfare seen in the Middle East. The imbalance of power among regional actors could allow CW to play an increasingly significant role in achieving military or political objectives.

36. The success and publicity of the Iraqi chemical weapons program will probably stimulate

countries, to acquire chemical weapons. It is apparent that these countries, and others in the region, are actively seeking to strengthen their military postures in response to perceived regional threats. We expect them to seek indigenous CW capabilities as part of their defense modernization efforts. The proliferation of CW capabilities is likely to have a further destabilizing effect on Asian regional power balances until an equilibrium is achieved.

37. We believe that, if Vietnam builds a militarily significant domestic chemical warfighting capability in coming years, other Asian nations are likely to feel compelled to develop comparable means to contend with the threat. Already we see expressions of interest in acquiring protective capabilities by [redacted] Indonesia

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40. *Africa.* Indigenous CW capabilities on the African continent are known to exist only in Egypt and possibly in Libya

[redacted]

41. In much of Africa, if the capabilities existed, the remoteness of many regions and inaccessibility to Western observers could make the potential for use of CW somewhat greater, as the likelihood for international detection or confirmation would be reduced. Furthermore, the low level of military sophistication and lack of CW protective capabilities make the potential for CW use both inviting and of significant tactical advantage.

42. Financial constraints are likely to be the most important inhibitor to CW proliferation in this region. This factor creates opportunities for other nations with newly acquired CW capabilities or a growing CW-materials industry to gain some political leverage by assisting less developed countries in CW program development. We expect, however, that conventional weapons acquisition will continue to take priority in defense modernization programs in most African nations until conventionally armed forces are well established.

43. *Central and South America and the Caribbean*

[redacted]

Cuban forces are trained to operate in a CW environment and could probably conduct offensive chemical warfare in a number of regions where Cuban expeditionary forces are stationed. We do not yet see indications of chemical weapons proliferation to other Caribbean nations, probably because those countries have insufficient military force structures to support a CW program.

44. Although we have little evidence to confirm much interest in acquisition of CW capabilities in Central and South America, no region should be

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presumed immune from chemical weapons proliferation.

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Clearly, planning for CW contingencies must be incorporated in operational plans for most theaters of potential deployment.

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45. Nicaragua, with Cuban and Soviet assistance, has acquired CW protective and decontamination equipment. We do not know whether Nicaragua sought this materiel or whether it appeared as a part of the standard military assistance package. Increased global attention to CW suggests that most military forces will, at a minimum, undertake assessments of the regional CW threat and of their vulnerabilities and, where appropriate, take actions to rectify any imbalance. Once the seeds of a CW program have been planted, we expect slow but steady program growth.

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Implications for US Forces

46. Although most of the concern about the CW threat to US forces has been focused on possible Soviet use in Europe, there are other areas where US forces are also vulnerable. For example, the Presidential Chemical Warfare Review Commission noted in June 1985: *The possibility exists that North Korea, a country not noted for restraint, would use chemical weapons to attack US and Republic of Korea forces that are in South Korea.... The threat of attack in the Far East has not received adequate attention, even though Asia is where chemical weapons most recently have been employed.*

47. Likewise, the ready availability of chemical weapons in the Middle East significantly increases the potential for US and Allied forces deployed to that region in either military actions or peacekeeping roles to be subjected to CW attack. On the basis of our knowledge of the CW capabilities of Middle Eastern countries, we would expect traditional agents—for example, mustard, tabun, or sarin—to be used.

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Potential for Terrorist Use of CW

50. The spread of chemical weapons capabilities into Third World states increases the likelihood that terrorists will acquire these weapons and/or the capability to produce and weaponize them in the near future. The publicity given recent incidents of CW and industrial chemical accidents may also heighten awareness of the potential for using CW as a method of drawing attention to a terrorist group's cause.

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51. We believe that successful CW use by any terrorist group would lower the threshold of restraint on its subsequent application by other terrorists. However, as long as terrorist objectives are being met through current techniques, there is little practical reason to turn to CW. Motivational considerations, rather than technological constraints, probably account for the low incidence of terrorist use of CW so far.

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52. Our analysis suggests that it is within the capability of many terrorist groups to fabricate chemical weapons on a limited scale and use them against selected targets, causing multiple casualties—dozens to several hundreds. Production of small quantities of agents is not much more difficult than clandestine production of narcotics and well within the means of a sophisticated terrorist organization or disaffected group.

53. Many of the chemicals traditionally considered as warfare agents—phosgene, chlorine, hydrogen cyanide, and cyanogen chloride—can be purchased virtually anywhere in an industrialized, open society. The details on techniques, safety procedures, and equipment for producing the more toxic nerve agents are in the open literature. The chemical precursors are also available or can be produced in small quantities with relative ease. The risk associated with production of small quantities (about 2 kg) of nerve agent in a facility such as an apartment or single family dwelling is relatively low. With substantially larger quantities, the risk level increases.

54. As an alternative to fabricating CW agents or obtaining them from patron states, terrorist groups might try to steal them from the civil sector—for example, from university research laboratories, civilian industrial facilities, or government laboratories—or to steal them during shipment to these facilities. Less likely would be an attempted terrorist attack on a military storage facility.

55. Also, the wide availability of toxic industrial chemicals, including those also considered traditional CW agents, makes the potential for hijacking, sabotage, and theft of these substances as they are transported by tank car and railcar very real. Entire towns could be held hostage by terrorists with a threat to vent tank cars of toxic chemicals.

56. The technical obstacles to terrorist use of chemical weapons for inflicting mass casualties—many hundreds—are generally much more formidable than for multiple casualties. The obstacles include a higher relative cost and investment of time, greater complexity of disseminating equipment (for most, though not all, mass casualty scenarios), increased physical risk to the terrorists in manufacturing and transporting large quantities of agent, and greater likelihood of detection at some phase of the process.

57. Possible objectives for terrorist use of CW include making a novel, dramatic statement to draw public attention to their cause, to instill fear, to inflict casualties, to force withdrawal of unprepared military

forces from foreign deployments, or to cause economic disruption in a fragile economy with hopes of destabilizing a government. Only small quantities of agent would be required for such uses.

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58. The Middle East is a particularly ripe target for terrorist use of chemical weapons. Most of the major powers in this region now possess some CW capability. The possibility exists that the Governments of Iran or Libya, which have supported terrorist activities in the past, might willfully supply chemical agents to terrorists. The drilling rigs and refineries of Persian Gulf oilfields are potential high-value CW targets. Access could easily be denied by attack with a persistent agent, although substantial quantities of agent would be required.

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59. Chemical and toxin agents have been used in the past as assassination weapons and may become increasingly popular as terror weapons against limited targeted populations. The subdued public response to use of chemical weapons in recent conflicts may well lower inhibitions to their use by terrorists as well. Previous assessments have considered that fear of causing an adverse public response rather than garnering sympathy or support to their cause may have served as an inhibitor to terrorist use of CW. This consideration may no longer be valid.

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Implications for Arms Control

60. Perhaps the greatest threat to an effective chemical weapons treaty posed by proliferation is the possibility that states will elect not to become parties. As more nations acquire CW capabilities, the likelihood of ratification of or accession to a treaty may be questionable in regions of perpetual conflict (for example, Southeast Asia and the Middle East). States with recently acquired CW capabilities may be unwilling to forgo the perceived military advantage that these weapons confer if they doubt accession or compliance by hostile neighbors.

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61. Although the 1925 Geneva Protocol bans use of chemical weapons in war, there are no global legal constraints on the production or possession of chemical weapons. The efficacy of the Protocol is further eroded by the fact that many parties ratified with several reservations, so that it is often said to have been reduced to a ban on first use, in war, against other parties only. While efforts are under way at the Geneva Conference on Disarmament to negotiate a comprehensive ban on the development, production, stockpiling, retention, transfer and use of these weapons, proliferation of chemical warfare capabilities

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exacerbates negotiating problems and imperils the prospects for consummation of any global treaty. [redacted]

62. The US draft treaty under discussion in Geneva would require each party to declare whether it has under its control anywhere any chemical weapons, chemical weapons production facilities, supertoxic lethal chemicals, or key precursors or production facilities thereof. Likewise, detailed declarations of past transfers of chemical agents would be required.

for CW use in the future. Although most Third World countries do not subscribe to the US position that herbicides and riot-control agents do not fall under the purview of chemical weapons constraints, we may see countries with newly acquired CW capabilities use such chemicals with impunity, adopting the US position of exclusion when convenient for them. These agents possess toxic properties that may be lethal in certain conditions. Escalation from use of herbicides and riot-control agents to more lethal agents is likely—as seen in Iraq—thus exacerbating the present problems of ascertaining whether prohibited chemical agents are being used. [redacted]

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65. We also question the existence of the presumed international moral constraints against use of chemical weapons. Western abhorrence of these weapons stems from their use in World War I and subsequent publicity intended to create popular opinion against CW. To a large extent, the countries addressed in this Estimate lack such previous exposure. National attitudes toward chemical warfare may be swayed either positively or negatively by chemical accidents (such as in Bhopal), which have demonstrated the devastating potential of chemicals. [redacted]

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64. We believe that the relative lack of international reprimand or sanctions against those countries using CW in recent conflicts will lower the threshold

66. The perceived utility of chemical weapons as demonstrated in recent conflicts may cause another historical barrier to crumble. Military planners have traditionally exhibited resistance to use of CW because of the uncertainties of its effectiveness based on such variables as weather, delivery concentration, and protective capabilities of opposing forces. Because the standards of successful employment may be different than US expectations, military effectiveness may in fact be judged higher by Third World nations than by ourselves. If CW acquires the reputation of having particular effectiveness in certain tactical scenarios, resistance to its use is certain to be lowered. [redacted]

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